TABLES

TABLE 1

Main Compounds of Concern

Main Compounds of Concern (COCs)	
Volatile Organic Compounds	Trichloroethene (TCE)
	Tetrachloroethene / Perchloroethene (PCE)
	Trichlorofluoromethane (Freon 11)
	1,1,2-Trichloro-1,2,2,-trifluoroethane (Freon 113)
	1,1-Dichloroethene (1,1-DCE)
	cis-1,2-Dichloroethene (cis-1,2-DCE)
	chloroform
	carbon tetrachloride
	1,1-Dichloroethane (1,1-DCA)
	1,2-Dichloroethane (1,2-DCA)
	1,1,2-Trichloroethane (1,1,2-TCA)
Other	1,4-dioxane
	hexavalent chromium

DRAFT

TABLE 2

SUPPLEMENTAL OU2 SOURCE IDENTIFICATION, LEADING EDGE INVESTIGATION WORK AREA VICINITY

MAP ID	DATABASE[1,2]	DATABASE ID	SITE NAME	ADDRESS
1	Geotracker	T10000004356	7 ELEVEN RETAIL CONVENIENCE STORE	13203 TELEGRAPH ROAD, SANTA FE SPRINGS
2	Geotracker	T10000006363	76 FUEL STATION	11651 TELEGRAPH RD, SANTA FE SPRINGS
3	Envirostor	71003644	ACCURIDE INTERNATIONAL	12311 SHOEMAKER AVENUE, SANTA FE SPRINGS
4	Geotracker	SL2041J1510	ALEXANDER BELL PROPERTY	10025 BLOOMFIELD AVE, NORWALK
5	Envirostor	71003584	ALL BLACK CO.	13090 PARK STREET, SANTA FE SPRINGS
6	Other	NA	AMITY INC	10926 PAINTER AVE, SFS CA 90670
7	Envirostor	19750080	ATLAS RADIATOR, INCORPORATED	10110 NORWALK BLVD, SANTA FE SPRINGS
8	Other	NA	B&R FINISHING CO	13560 TELEGRAPH RD, WHITTIER, CA 90605
9	Geotracker	T0603701550	BAKER PETROLITE CORPORATION (same address as Baker Performance Chemicals)	11808 BLOOMFIELD AVE S, SANTA FE SPRINGS
10	Geotracker	T0603701563	BALBOA-PACIFIC BUSI.(FORMER)	11240 BLOOMFIELD AVE, SANTA FE SPRINGS
11	Both	60000159	BEAUMON TRUST PROPERTY	12525 PARK AVENUE, SANTA FE SPRINGS
12	Geotracker	T0603799560	BLOOMFIELD BUSINESS CENTER	11020 BLOOMFIELD, SANTA FE SPRINGS
13	Other	NA	BRENNTAG PACIFIC	10747 PATTERSON PLACE SFS, CA 90670
14	Geotracker	T0603701574	BROTHERS AUTO	10801 NORWALK BLVD, SANTA FE SPRINGS
15	Both	T0603703121	CALIFORNIA INDUSTRIAL PRODUCTS	11525 SHOEMAKER AVE, SANTA FE SPRINGS
16	Geotracker	T0603704082	CAMALL TRUCKING	11333 GREENSTONE AVE, SANTA FE SPRINGS
17	Geotracker	T0603702916	CERRITOS YARD	12015 SHOEMAKER AVE, SANTA FE SPRINGS
18	Geotracker	T0603705255	CERTIFIED LIFE TRUCK CO	10105 SHOEMAKER AVE, SANTA FE SPRINGS
19	Geotracker	T0603705376	CHARLES L GODBEY	10840 NORWALK BLVD S, SANTA FE SPRINGS
20	Geotracker	SLT43363361	CHEVRON - CONARD SITE	SHOEMAKER AVE, SANTA FE SPRINGS
21	Geotracker	T0603702757	CHEVRON #9-5306	12155 TELEGRAPH RD, SANTA FE SPRINGS
22	Geotracker	T0603705030	CIRCLE K LIC DEPT #3064	11462 SLAUSON AVE E, SANTA FE SPRINGS
23	Geotracker	T0603791333	CIRCLE K STORE #5234	12105 PIONEER BLVD S, NORWALK
24	Geotracker	T0603703815	CITY OF NORWALK	12700 NORWALK BLVD S, NORWALK
25	Geotracker	T0603702900	CITY OF NORWALK MAINT. YARD	12735 CIVIC CENTER DR, NORWALK
26	Envirostor	19070002	CITY OF NORWALK TRANSPORTATION YARD	12737 CIVIC CENTER DRIVE, NORWALK
27	Geotracker	T0603705258	CITY OF SANTA FE SPRINGS	11400 GREENSTONE, SANTA FE SPRINGS
28	Geotracker	SLT43106104	CITY OF SANTA FE SPRINGS	BLOOMFIELD AVE, SANTA FE SPRINGS
29	Geotracker	T0603703656	CITY OF SANTA FE SPRINGS F.D.	11736 TELEGRAPH RD E, SANTA FE SPRINGS
30	Geotracker	T10000004897	CITY OF SANTA FE SPRINGS FIRE-RESCUE	11300 GREENSTONE AVE, SANTA FE SPRINGS
31	Geotracker	T0603704370	CON'S WOOD PRODUCTS (FORMER)	11831 SHOEMAKER AVE, SANTA FE SPRINGS
32	Geotracker	T0603703210	CON-WAY WESTERN EXPRESS LK #2	12903 LAKELAND RD E, SANTA FE SPRINGS
33	Geotracker	T0603702731	COPP PAVING CO.	11927 GREENSTONE AVE S, SANTA FE SPRINGS
34	Geotracker	T0603703239	FETTER'S TRANSPORTATION	11910 GREENSTONE AVE S, SANTA FE SPRINGS
35	Geotracker	T0603703125	FIRESTONE	12225 IMPERIAL HWY E, NORWALK
36	Geotracker	SL0603744531	FORMER RIVERSIDE STEEL SITE	11401 GREENSTONE AVENUE, SANTA FE SPRINGS
37	Envirostor	71003318	GALAXY BRAZING CO., INC. - SANTA FE SPRINGS	10015 FREEMAN AVENUE, SANTA FE SPRINGS
38	Geotracker	T0603701573	GEMINIS PROPERTY DEVELOPMENT	11212 NORWALK S, SANTA FE SPRINGS
39	Geotracker	T0603793031	GOLDEN SHELL	12843 NORWALK BLVD S, NORWALK
40	Both	SL2045G1620	HALLIBURTON ENERGY SERVICES (FORMER)	12320 SOUTH BLOOMFIELD AVE, SANTA FE SPRINGS
41	Geotracker	T0603703235	HERITAGE CORPORATE CENTER	10445 NORWALK BLVD S, SANTA FE SPRINGS
42	Geotracker	T0603704155	IBM BUILDING	12501 IMPERIAL HWY E, NORWALK
43	Envirostor	19240002	IMPERIAL ANCHOR PALLET	12246 PARK AVENUE, SANTA FE SPRINGS

DRAFT

TABLE 2

SUPPLEMENTAL OU2 SOURCE IDENTIFICATION, LEADING EDGE INVESTIGATION WORK AREA VICINITY

MAP ID	DATABASE[1,2]	DATABASE ID	SITE NAME	ADDRESS
44	Other	NA	IMPERIAL HONING	10030 GREENLEAF AVE, SFS CA 90670
45	Geotracker	SLT43330328	JOHN ALEXANDER CO.	12040 E. FLORENCE AVE, SANTA FE SPRINGS
46	Envirostor	19820103	JOHN GLENN HIGH SCHOOL EXPANSION	13520 SHOEMAKER AVENUE, NORWALK
47	Geotracker	T10000004450	Kalico Dump No. 1	11921 Shoemaker, Santa Fe Springs
48	Geotracker	T0603703627	KEDDAWAY TRUCK LINES	12133 GREENSTONE AVE S, SANTA FE SPRINGS
49	Envirostor	60000424	KELLY PIPE CO., LLC	11700 BLOOMFIELD, SANTA FE SPRINGS
50	Geotracker	T0603703236	KEYSTONE FORD	11729 IMPERIAL HWY E, NORWALK
51	Geotracker	T0603703016	K-MART	13131 TELEGRAPH RD E, SANTA FE SPRINGS
52	Envirostor	19830006	LA CTRS FOR ALCOHOL AND DRUG ABUSE	11015 BLOOMFIELD AVENUE, SANTA FE SPRINGS
53	Envirostor	60000908	LAKEVIEW PARK RECREATION FACILITY	JOSLIN STREET AND JERSEY AVENUE, SANTA FE SPRINGS
54	Other	NA	LEWIS INDUSTRIES	10024 GEARY AVE, SFS CA 90670
55	Envirostor	19281191	LIFE PAINT COMPANY	12911 SUNSHINE AVENUE, SANTA FE SPRINGS
56	Geotracker	T0603704049	LITTLE LAKE CITY SCHOOL DIST.	10515 PIONEER BLVD S, SANTA FE SPRINGS
57	Other	NA	LITTLE LAKE DEVELOPMENT	12046 FLORENCE AVE, SFS CA 90670
58	Envirostor	71003793	LOS ANGELES SERVICE CENTER	9920 FREEMAN AVE, SANTA FE SPRINGS
59	Geotracker	T0603704018	MC MULLEN OIL COMPANY	10530 SHOEMAKER AVE, SANTA FE SPRINGS
60	Geotracker	SLT4305351	MCGRANAHAM COMMERCE CTR II	BLOOMFIELD AVE, SANTA FE SPRINGS
61	Geotracker	T0603702703	MOBIL #11-F20	12616 IMPERIAL HWY, NORWALK
62	Geotracker	T0603704599	MONTGOMERY WARDS	12051 IMPERIAL HWY E, NORWALK
63	Other	NA	MOTORCAR PARTS & ACCESSORIES	10430 SLUSHER DR, SFS CA 90670
64	Geotracker	SL0603746411	NIXON-EGLI EQUIPMENT	12030 CLARK ST, SANTA FE SPRINGS
65	Envirostor	19280515	NO (SAME ADDRESS AS NEVILLE CHEMICAL)	12800 IMPERIAL HWY, SANTA FE SPRINGS
66	Envirostor	80000086	NORWALK AF POL DISTRICT	, NORWALK
67	Geotracker	SL2046D1645	NORWALK, CITY OF	13900 NORWALK BLVD, NORWALK
68	Other	NA	P&B MANUFACTURING	12131 SHOEMAKER AVE, SFS CA 90670
69	Other	NA	PALACE CLEANERS	12307 NORWALK BLVD, NORWALK, CA
70	Geotracker	T10000001907	PEDCO	9911 NORWALK, SANTA FE SPRINGS
71	Envirostor	19340724	PLATE SHOP, THE	10701 FOREST STREET, SANTA FE SPRINGS
72	Both	SL204751665	PMC SPEC INC	10051 ROMANDEL AVENUE, SANTA FE SPRINGS
73	Geotracker	T0603704732	PMC SPECIALTIES	10733 PAINTER AVE S, SANTA FE SPRINGS
74	Envirostor	19300236	POLYMER CONCEPTS	12830 IMPERIAL HIGHWAY, SANTA FE SPRINGS
75	Geotracker	T0603705249	PORVENE MCKEE	12740 LAKELAND RD, SANTA FE SPRINGS
76	Other	NA	PRECISION CONTROL FINISHING	12150 S. BLOOMFIELD AVE, SFS CA 90670
77	Envirostor	71002884	PRECISION TUBE BENDING	13626 TALE STREET, SANTA FE SPRINGS
78	Envirostor	60000466	PRODUCTOL, INC.	10051 ROMANDEL AVE., SANTA FE SPRINGS
79	Geotracker	T0603704224	RAMCO FIRE PROTECTION	13105 LAKELAND RD, SANTA FE SPRINGS
80	Geotracker	T0603702796	REBAR ENGINEERING, INC.	10706 PAINTER AVE S, SANTA FE SPRINGS
81	Envirostor	19340776	REGIONAL PUBLIC SAFETY TRAINING CENTER	11400 GREENSTONE AVENUE, SANTA FE SPRINGS
82	Envirostor	60002148	REGIONAL PUBLIC SAFETY TRAINING CENTER PARCEL #2	11400 SHOEMAKER AVENUE, SANTA FE SPRINGS
83	Geotracker	T0603701577	S E PIPELINE CONSTRUCTION CO	11832 BLOOMFIELD AVE, SANTA FE SPRINGS
84	Geotracker	T0603703432	SHELL #204-5472-0309	11755 IMPERIAL BLVD E, NORWALK
85	Geotracker	T0603701568	SHELL #204-6960-0405	13203 TELEGRAPH RD E, SANTA FE SPRINGS
86	Geotracker	T0603796891	SHELL SERVICE STATION	11755 IMPERIAL HWY., NORWALK
87	Geotracker	T0603704257	SILVEY TRANSPORTATION (FORMER)	12027 GREENSTONE AVE, SANTA FE SPRINGS

DRAFT

TABLE 2

SUPPLEMENTAL OU2 SOURCE IDENTIFICATION, LEADING EDGE INVESTIGATION WORK AREA VICINITY

MAP ID	DATABASE[1,2]	DATABASE ID	SITE NAME	ADDRESS
88	Envirostor	71002233	SONIC PLATING CO., INC. - SANTA FE SPRINGS	13002 LOS NIETOS ROAD, SANTA FE SPRINGS
89	Geotracker	T0603704058	SOUTH PACIFIC STEEL	9835 SANTA FE SPRINGS RD, SANTA FE SPRINGS
90	Geotracker	T0603705286	SOUTH WHITTIER SCHOOL DISTRICT	10120 PAINTER AVE, SANTA FE SPRINGS
91	Other	NA	SPACE AGE CHEMICALS	13009-G LOS NIETOS RD, SFS CA 90670
92	Envirostor	19990018	STANKOVICH II	12601 BLOOMFIELD, SANTA FE SPRINGS
93	Geotracker	SLT43332330	STATE FARM INSURANCE	GEARY AVE, SANTA FE SPRINGS
94	Geotracker	T0603703930	STEEL FORM CONTRACTING	12021 SHOEMAKER AVE S, SANTA FE SPRINGS
95	Geotracker	T0603704722	STRECKER CONSTRUCTION CO	11922 BLOOMFIELD AVE, SANTA FE SPRINGS
96	Geotracker	T0603703612	SUNRISE LANDSCAPE	12542 CLARK AVE, SANTA FE SPRINGS
97	Geotracker	T0603704119	SUPERIOR OIL TOOL	12180 FLORENCE AVE E, SANTA FE SPRINGS
98	Geotracker	SLT4L1961777	TORCO USA LUBRICANT (FORMER)	12247 LAKELAND ROAD, SANTA FE SPRINGS
99	Geotracker	T0603705012	TOSCO - 76 STATION #6916 (FORMER)	12205 IMPERIAL HWY E, NORWALK
100	Both	19280771	TOXO SPRAY DUST COMPANY	12651 LOS NIETOS ROAD, SANTA FE SPRINGS
101	Geotracker	T0603703940	TRANSIT MIXED CONCRETE COMPANY	12222 FLORENCE AVE E, SANTA FE SPRINGS
102	Envirostor	71003689	TRIDENT PLATING, INC.	10046 ROMANDEL AVENUE, SANTA FE SPRINGS
103	Envirostor	71002926	TROJAN BATTERY CO. - CLARK ST FAC	12380 CLARK STREET, SANTA FE SPRINGS
104	Geotracker	SLT43365363	UNOCAL - CENTRAL S.F.S.O.F.	12404 MCCANN DR, SANTA FE SPRINGS
105	Geotracker	T0603703176	UNOCAL #5435	11651 TELEGRAPH RD, SANTA FE SPRINGS
106	Envirostor	19290245	WALKER PROPERTIES	SW CORNR OF BLOOMFIELD AVE & LAKELAND RD, SANTA FE SPRINGS
107	Geotracker	T0603703246	WALKER-TURNER PROPERTY	SW CORNR OF BLOOMFIELD AVE & LAKELAND ROAD, SANTA FE SPRINGS
108	Geotracker	T0603701570	WASTE MANAGEMENT PORTABLES	10600 PAINTER AVE, SANTA FE SPRINGS
109	Other	NA	WESTERN ALLIED	12046 E FLORENCE AVE, SFS CA 90670
110	Other	NA	WHITING ENTERPRISES	10140 ROMANDEL AVE, SFS CA 90670
111	Envirostor	19270327	WHITTIER ENGRAVING COMPANY	12631, 12633, 12637 LOS NIETOS ROAD, SANTA FE SPRINGS
112	Envirostor	80001174	WILSHIRE OIL CO.	, SANTA FE SPRINGS
113	Geotracker	T0603704169	WMC GRINDING	11813 SHOEMAKER AVE, SANTA FE SPRINGS
114	Geotracker	SLT4L7671866	YELLOW FREIGHT SYSTEMS	12250 EAST CLARK AVE., SANTA FE SPRINGS
115	Geotracker	SLT4304644	YOZYA MANAGEMENT	10600 SHOEMAKER AVE, SANTA FE SPRINGS

[1] Geotracker, Envirostor or Both: Downloaded databases on July 11, 2016 from followings sites: http://geotracker.waterboards.ca.gov/data_download.asp and http://www.envirostor.dtsc.ca.gov/public/data_download.asp. Note: did not include source/potential source sites that were outlined in Remedial Investigation (RI) Report (CH2M Hill, 2010), refer to document text for listing of RI Report sources/potential sources.

[2] Other sites identified based on review of historical state and local agency records including but not limited to the South Coast Air Quality Management District, the Los Angeles Department of Public Works, the Santa Fe Springs Fire Department, the Los Angeles County Fire Department, the Santa Fe Springs Fire Department, the Los Angeles County Fire Department, the Los Angeles County Engineer.

NA Not applicable

Step 1 - Problem Statement / Objective		**There is a need to evaluate the groundwater chemistry and vertical gradients at three locations within the LE Area as specified in the SOW to a depth of 500 feet bgs.**			
Step 2 - Principal Study Goals	*Principal Study Goals*	1. Determine the appropriate screen intervals for the wells in each LEI monitoring well cluster.	2. Characterize the vertical distribution of COCs in the LEI monitoring wells.	3. Characterize the vertical groundwater gradients in the LE Area.	
	Potential Outcomes	Select up to five screen interval depths for the installation of monitoring wells at each LEI monitoring well cluster location	Collect samples for laboratory analysis to obtain COC data from the LEI monitoring wells to further characterize the vertical extent of COCs in the LE Area	Measure groundwater elevations in the LEI monitoring wells and Koontz Well to evaluate the vertical gradients at each monitoring well cluster	
Step 3 - Inputs to the Decision	*Needed Information*	Lithologic logs including field observations of drill rig behaviors and geophysical logs; natural gamma; spontaneous potential, 16-inch normal resistivity, 64-inch normal resistivity, lateralog-3, and caliper/borehole volume at an exploratory boring at each LEI monitoring well cluster location. The existing hydrogeologic CSMs including the LE area prepared by EPA, DWR, and USGS.	Analytical data of COC concentrations at LEI monitoring wells including: TCE, PCE, Freon 11, Freon 113, 1,1-DCE, cis-1,2-DCE, chloroform, carbon tetrachloride, 1,1-DCA, 1,2-DCA, 1,1,1-TCA, 1,4-dioxane, and hexavalent chromium.	Depth to water and top of casing point of reference elevation at LEI monitoring wells and Koontz Well	
	Source of Needed Information or Data	Field notes on lithologic logging of borings at LEI monitoring well cluster locations. Geophysical logs of the exploratory boring at each LEI well cluster location.	Groundwater samples collected for three quarterly monitoring events from LEI monitoring wells following installation	Depth to water measurements performed in the LEI monitoring well clusters during three quarterly monitoring events following installation. Water levels collected with transducer data for a period of at least one month in the LEI monitoring well clusters and the Koontz well cluster.	
	Action Levels	NA	MCLs: TCE (5µg/L), PCE (5µg/L), Freon 11 (150µg/L), Freon 113 (1,200µg/L), 1,1-DCE (6µg/L), cis-1,2-DCE (6µg/L), chloroform (80µg/L*), carbon tetrachloride (0.5µg/L), 1,1-DCA (5µg/L), 1,2-DCA (0.5µg/L), 1,1,1-TCA (200µg/L), and hexavalent chromium (10µg/L) NL: 1,4-dioxane (1µg/L)	NA	
	Field Methods	Lithologic logging of drill cuttings. observations of drill rig behavior including speed and drill chatter, and geophysical logging	Groundwater sampling from LEI monitoring wells	Water level measurements and surveying at LEI monitoring wells	Collection of pressure transducer data and surveying at LEI monitoring wells
	Analytical Methods	Geophysical logs: natural gamma; spontaneous potential, 16-inch normal resistivity, 64-inch normal resistivity, lateralog-3, and caliper/borehole volume	VOCs by EPA Method 8260B Hexavalent chromium by EPA Method 218.6 1,4-dioxane by EPA Method 8270C SIM	NA	

Step 4 - Study Boundaries	***Target Population***			
	Coarse grained depth intervals up to 500 ft bgs in the LEI monitoring well cluster locations	Three LEI monitoring well clusters that will characterize the distribution of contaminated groundwater in the LE Area up to 500 feet bgs. Groundwater samples will be collected in a sufficient volume to analyze for compounds and constituents listed in Step 3.	The three LEI monitoring well clusters for three quarters of water level measurements and the LEI and Koontz well cluster for transducer data collection.	
	Spatial Boundaries			
	The spatial boundaries for the LEI are specified in Attachment C of the Consent Decree. Monitoring wells and depths to be monitored include three new well clusters installed as part of the LEI, all screened intervals up to a depth of 500 feet.			
	Temporal Boundaries			
	To be initiated upon EPA approval of the LEI Work Plan	To be initiated upon completion of installation and development at each LEI monitoring well cluster and conducted for three quarters.	To be initiated upon completion of installation and development at each LEI monitoring well cluster. Water level measurements to be conducted for three quarters.	To be initiated upon EPA approval of the LEI work plan. Each well cluster to be monitored for a period of at least one month.
	Potential Practical Constraints			
	Obtaining access and permits to drill and install the LEI monitoring wells, the locations of buildings and utilities, city and/or county regulations on work hours	Well access constraints, damaged wells, insufficient water in wells for sampling		
Step 5 - Decision Rules/Analytic Process	***Parameter that Characterizes Population of Interest***			
	The parameters that characterize the population of interest are individual data points (water levels and COC concentrations) measured at LEI monitoring wells			
	Action Levels for Study			
	NA	Action levels are presented in Step 3.	NA	
	Reporting Limits			
	NA	The reporting limits are lower than the action levels (Step 3). TCE (0.50µg/L), PCE (0.50µg/L), Freon 11 (0.50µg/L), Freon 113 (0.50µg/L), 1,1-DCE (0.50µg/L), cis-1,2-DCE (0.50µg/L), chloroform (0.50µg/L), carbon tetrachloride (0.50µg/L), 1,1-DCA (0.50µg/L), 1,2-DCA (0.50µg/L), 1,1,1-TCA (0.50µg/L), 1,4-dioxane (1.0µg/L), and hexavalent chromium (1.0µg/L)	NA	

	Analytic Process/Decision Rule		
Step 5 - Decision Rules/Analytic Process (continued)	The deepest well in LEI Monitoring Well Clusters 1 and 2 will be screened in the deepest coarse grained layer greater than 10 feet in thickness observed in the exploratory boring to a maximum depth of 500 feet. The deepest coarse grained layer will be identified by the California Professional Geologist supervising the work based on review of the exploratory boring lithologic and geophysical logs. A brief transmittal will be prepared to convey the selected well depth intervals and supporting data to EPA for review and approval.	Concentrations of COCs for the monitoring wells in the three LEI monitoring well clusters will be compared to MCLs and NLs (Step 3).	Groundwater elevations for the monitoring wells in the three LEI monitoring well clusters will be presented in tables and figures.
	Up to four additional well screen intervals will be selected at each of these two LEI monitoring well clusters to be screened in the coarse grained layers. These layers will be identified by the California Professional Geologist supervising the work based on review of the exploratory boring lithologic and geophysical logs for each LEI monitoring well cluster location and the hydrogeologic CSMs. A brief transmittal will be prepared to convey the selected well depth intervals and supporting data to EPA for review and approval.		
	Following installation of LEI Monitoring Well Clusters 1 and 2 and review of the data collected from these wells, the location of LEI Monitoring Well Cluster 3 will be proposed for EPA review and approval. The process for selecting the screened intervals for this cluster will proceed as above.		
Step 6 - Tolerable Limits on Decision Rules	Acceptance criteria include confirmation that field data are: (1) representative of the geophysical conditions that exist, (2) comparable to subsequent or previously collected data and consistent with the current understanding of the existing CSMs, (3) complete to the extent that necessary conclusions may be obtained, and (4) accurate at the levels that are appropriate for determining the location of coarse grained intervals for monitoring well installation. Errors will be minimized by adhering to the field QA/QC protocols established in the QAPP and FSP.	Acceptance criteria include confirmation that laboratory data are: (1) representative of the chemical conditions that exist, (2) comparable to subsequent or previously collected data, (3) complete to the extent that necessary conclusions may be obtained, and (4) of known statistical significance in terms of precision and accuracy, at the levels that are appropriate for evaluating COC distribution. Errors will be minimized by adhering to the field QA/QC protocols established in the QAPP and FSP.	Acceptance criteria include confirmation that measurements are collected accurately to within 0.01 foot by repeating the measurement at each well and preparing legible and accurate field notes. Errors will be minimized by adhering to the field QA/QC protocols established in the QAPP and FSP.

Step 7 - Plan for Obtaining Data	Up to five monitoring well screen intervals at each well cluster will be selected as described above. The monitoring well depths and screen intervals will be selected to be in the coarsest grained layers. Geophysical logs will be used to select a screen interval for the deepest monitoring well in each well cluster. After the deepest well is installed, the geophysical and boring logs will be used to select up to four additional monitoring wells at each well cluster.	Groundwater samples will be collected using low-flow sampling procedures with either a submersible pump or bladder pump. Each well will be purged, and field parameters will be monitored during purging. Samples will be collected after field parameters have stabilized as described in the Water Quality Parameter Measurements SOP included in the FSP. All samples from the monitoring wells will be analyzed for VOCs by EPA Method 8260B; hexavalent chromium by EPA Method 218.6; and 1,4-dioxane by EPA Method 8270C SIM. Field and laboratory QA/QC samples will be collected and analyzed.	Water levels will be measured manually using a QED®, Solinst® or comparable flat tape electric water level sounder. Pressure transducers and data loggers will also be installed and used to record water levels for a period of at least one month.

Notes:
* - Total trihalomethanes = Bromodichloromethane, Bromoform, Chloroform, Dibromochloromethane

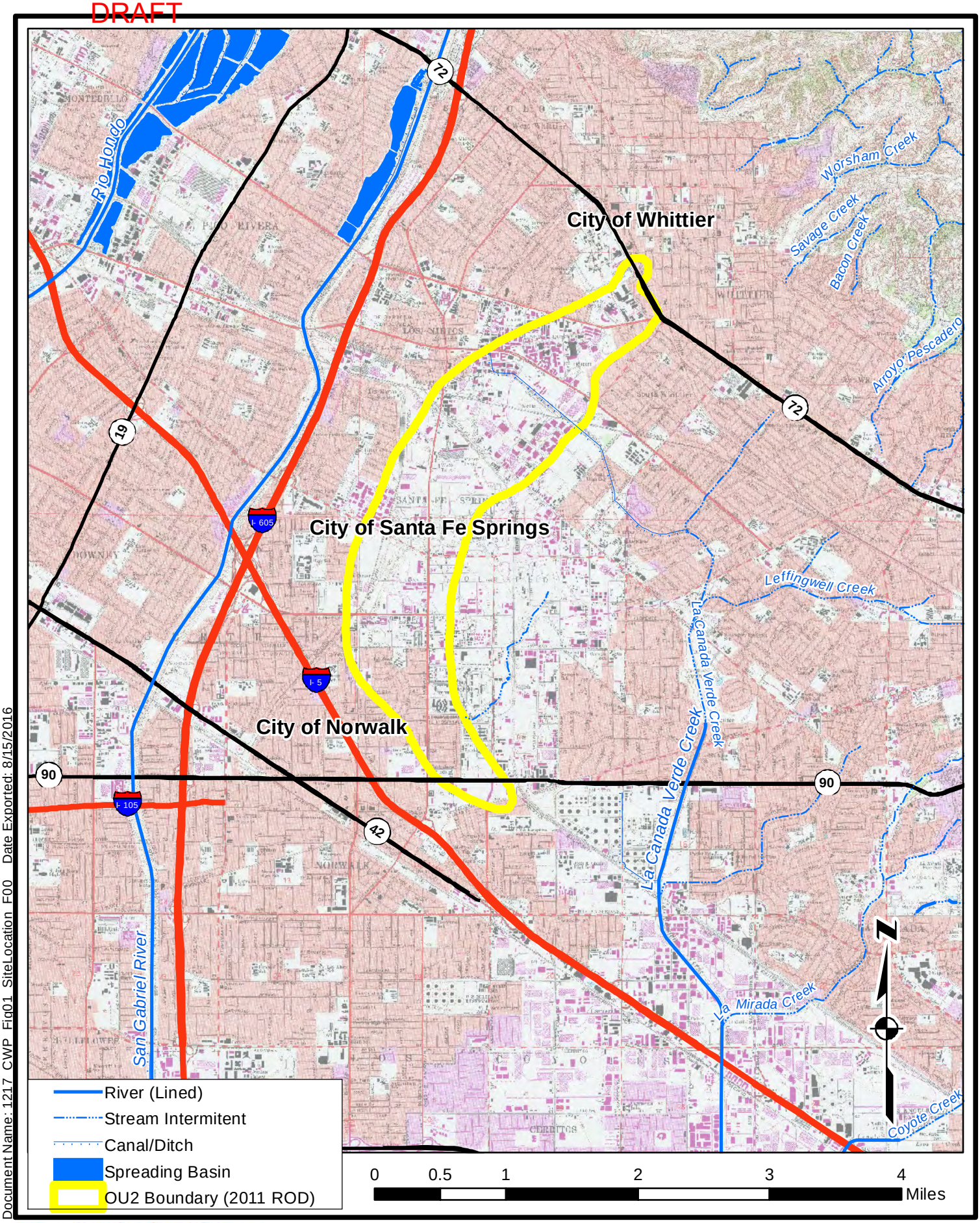
µg/L: micrograms per liter
µg/kg: micrograms per kilogram
mg/L: milligrams per liter
mg/kg: milligrams per kilogram
1,1-DCA: 1,1-Dichloroethane
1,1-DCE: 1,1-Dichloroethene
1,1,1-TCA: 1,1,1-Trichloroethane
1,2-DCA: 1,2-Dichloroethane
cis-1,2-DCE: cis-1,2-Dichloroethene
COCs: chemicals of concern
CSMs: Conceptual Site Models
DWR: Department of Water Resources
EPA: Environmental Protection Agency
FSP: Field Sampling Plan
feet bgs: feet below ground surface
Freon 11: trichlorofluoromethane
Freon 113: 1,1,2-Trichloro-1,2,2,-trifluoroethane
LE: Leading Edge
LEI: Leading Edge Investigation
MCLs: maximum contaminant levels
NA: not applicable
NLs: notification levels
OU2: Operable Unit 2
PCE: tetrachloroethene
QA/QC: quality assurance/quality control
QAPP: Quality Assurance Project Plan
ROD: Record of Decision
SOP: standard operating procedure
SOW: Statement of Work
TCE: trichloroethene
USGS: United States Geological Survey
VOC: volatile organic compound

References

California Code of Regulation Title 22. Sections 64431, 64444, 64449, and 64533. Last updated June 14, 2016
http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/lawbook/dwregulations-2016-06-14.pdf
Drinking Water Notification Levels and Response Levels: An Overview. Division of Drinking Water State Water Resources Control Board. February 4, 2015
http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/notificationlevels/notificationlevels.pdf

FIGURES

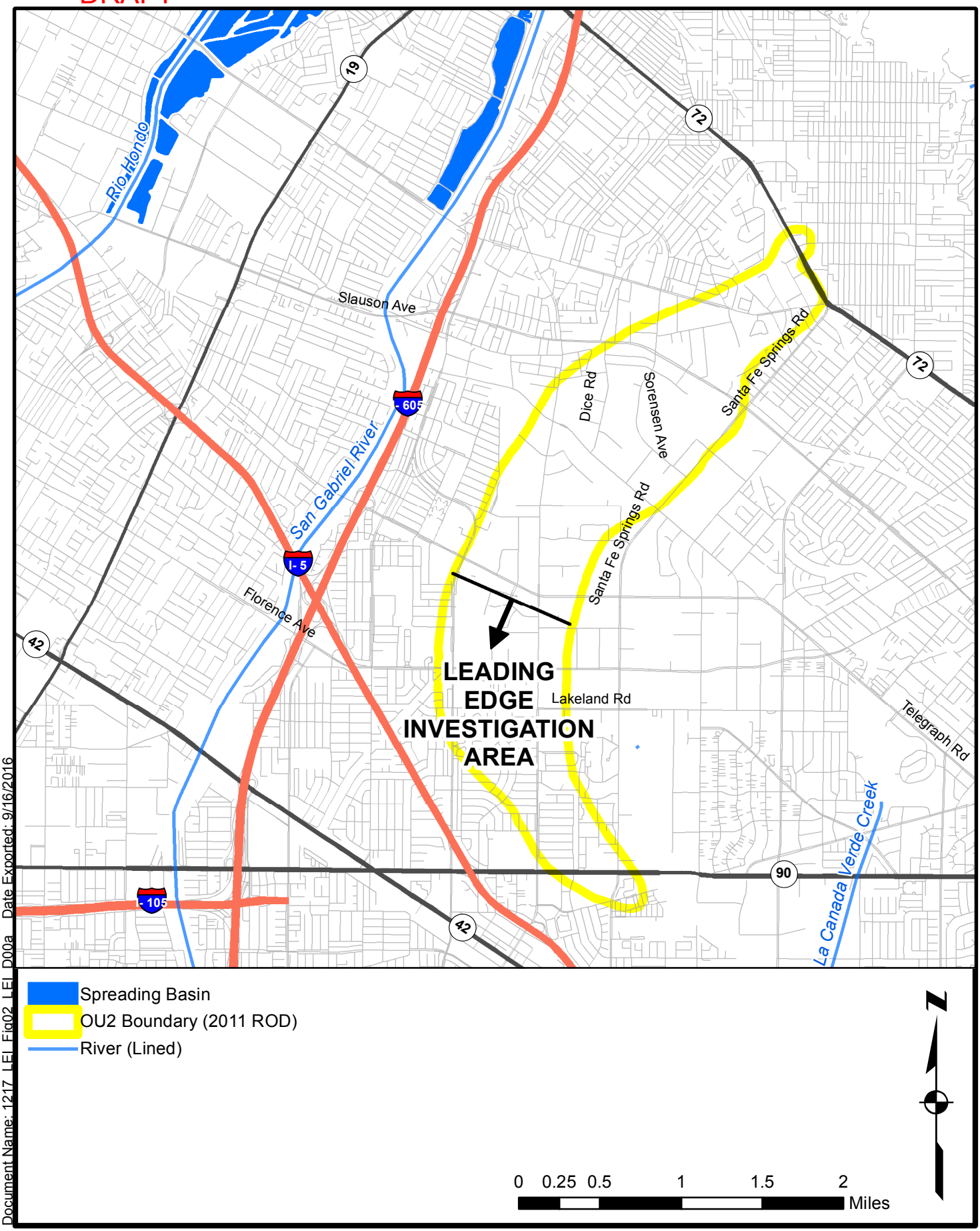
DRAFT



Document Name: 1217_CWP_Fig01_SiteLocation_F00 Date Exported: 8/15/2016

HARGIS + ASSOCIATES, INC
Hydrogeology/Engineering

FIGURE 1. SITE LOCATION

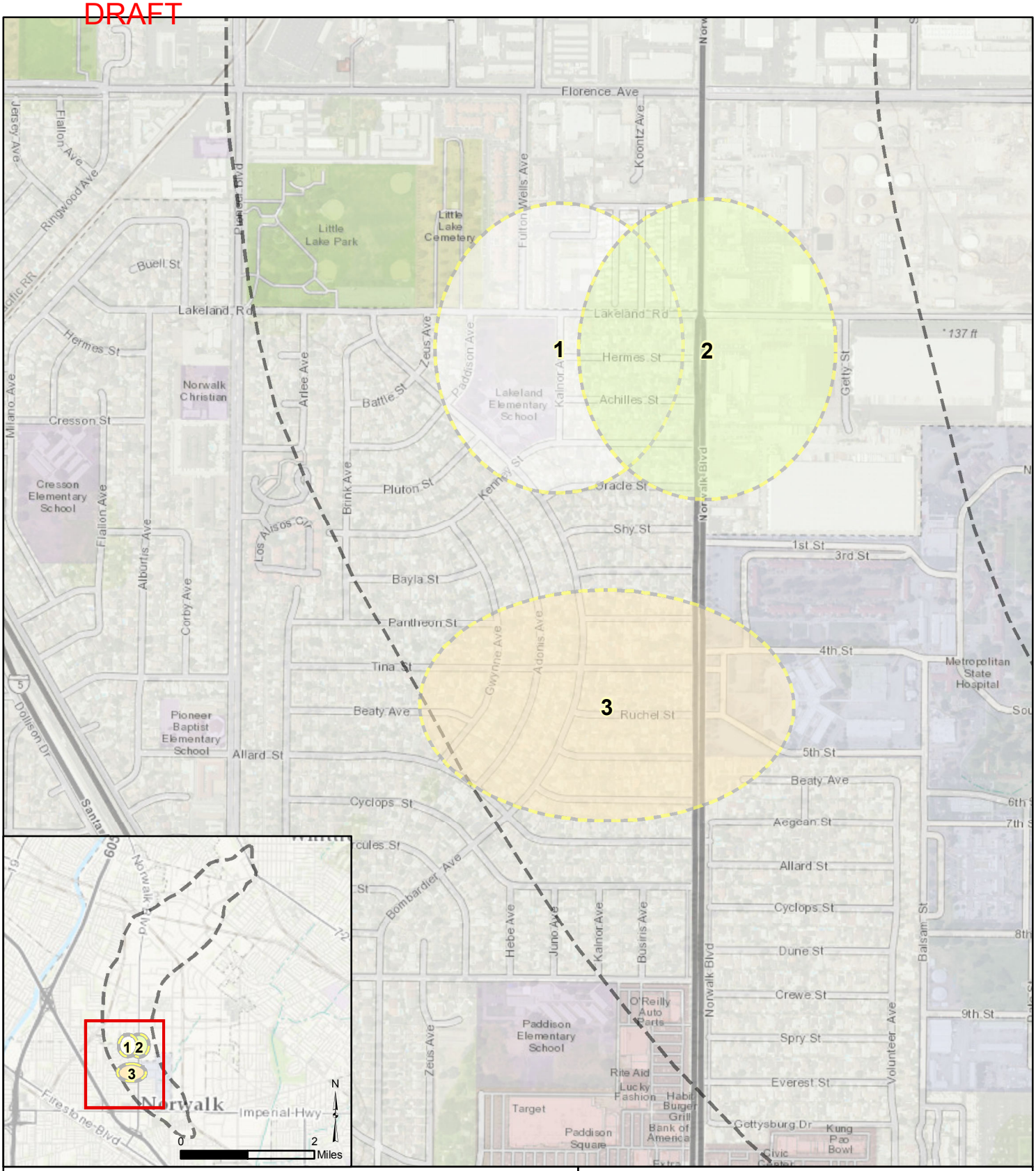


Document Name: 1217_LEI_Fig02_LEI_D00a Date Exported: 9/16/2016

HARGIS + ASSOCIATES, INC.
Hydrogeology/Engineering

FIGURE 2. LEADING EDGE AREA

DRAFT



Legend

- Proposed Monitoring Well Cluster
- Operable Unit 2 (OU2) Boundary

N

0 800 Feet

Proposed Well Cluster Locations

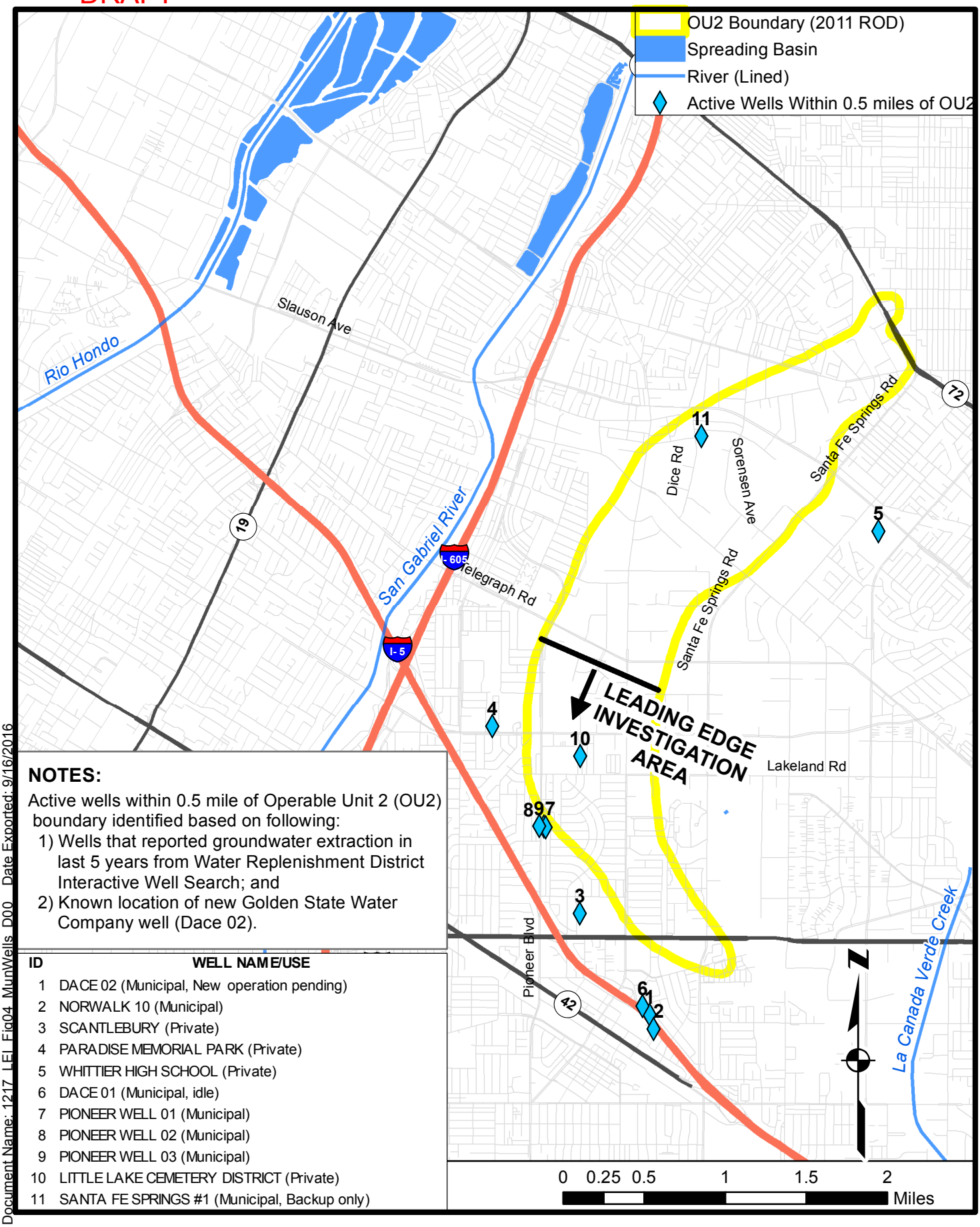
Omega Superfund Site - OU2
Los Angeles County, California

Geosyntec consultants

WR2209	July 2016	**Figure 3**

\\oakland-01\data\GIS\Omega\Project\2016\2016_LEIworkplan\Fig-02_ProposedLocations.mxd 7/25/2016 4:54:15 PM

DRAFT



NOTES:

Active wells within 0.5 mile of Operable Unit 2 (OU2) boundary identified based on following:

1) Wells that reported groundwater extraction in last 5 years from Water Replenishment District Interactive Well Search; and
2) Known location of new Golden State Water Company well (Dace 02).

ID	WELL NAME/USE
1	DACE 02 (Municipal, New operation pending)
2	NORWALK 10 (Municipal)
3	SCANTLEBURY (Private)
4	PARADISE MEMORIAL PARK (Private)
5	WHITTIER HIGH SCHOOL (Private)
6	DACE 01 (Municipal, idle)
7	PIONEER WELL 01 (Municipal)
8	PIONEER WELL 02 (Municipal)
9	PIONEER WELL 03 (Municipal)
10	LITTLE LAKE CEMETERY DISTRICT (Private)
11	SANTA FE SPRINGS #1 (Municipal, Backup only)

Document Name: 1217_LEI_Fig04_MunWells_D00 Date Exported: 9/16/2016

HARGIS + ASSOCIATES, INC
Hydrogeology/Engineering

FIGURE 4. ACTIVE GROUNDWATER PRODUCTION WELLS WITHIN 1/2 MILE OF OPERABLE UNIT 2

DRAFT

MW31
MW12
MW13A
MW13B
MW1A
MW1B
MW14
MW24A to MW24D
MW6
MW2
MW5
MW8A to MW8D
MW9A
MW9B
MW15
MW3
MW23A to MW23D
MW4A to MW4C
MW16A to MW16C
MW25A to MW25D
MW7
MW10
MW18A to MW18C
MW17A to MW17C
MW11
MW22
MW26A to MW26D
MW21
MW19
MW20A to MW20C
Hawkins 1a1 to Hawkins 1c5
LEADING EDGE INVESTIGATION AREA
MW27A to MW27D
Koontz 1a1 to Koontz 1c5
MW28
1
2
MW32
3
MW29
MW30

Legend

Monitoring Wells
- Installed by EPA
- Installed by WRD

OU2 Boundary (2011 ROD)

Proposed LEI Monitoring Well Cluster

Notes:
Wells co-located in groups of three or more have been labelled as a group (eg; MW26A to MW26D).
Locations of the LEI monitoring wells will be determined during well installation activities (Geosyntec, 2016).
LEI = Leading Edge Investigation
WRD = Water Replenishment District
OU2 = Operable Unit 2
ROD = Record of Decision

N

0 2,000 Feet

Work Area Monitoring Network

Omega Superfund Site - OU2
Los Angeles County, California

Geosyntec consultants

Figure 5

WR2209 | September 2016

\\oakland-01\data\GIS\Omega\Project\2016\LEIworkplan\Fig-05_WorkAreaMonitoringNetwork_NG.mxd 9/9/2016 4:28:51 PM

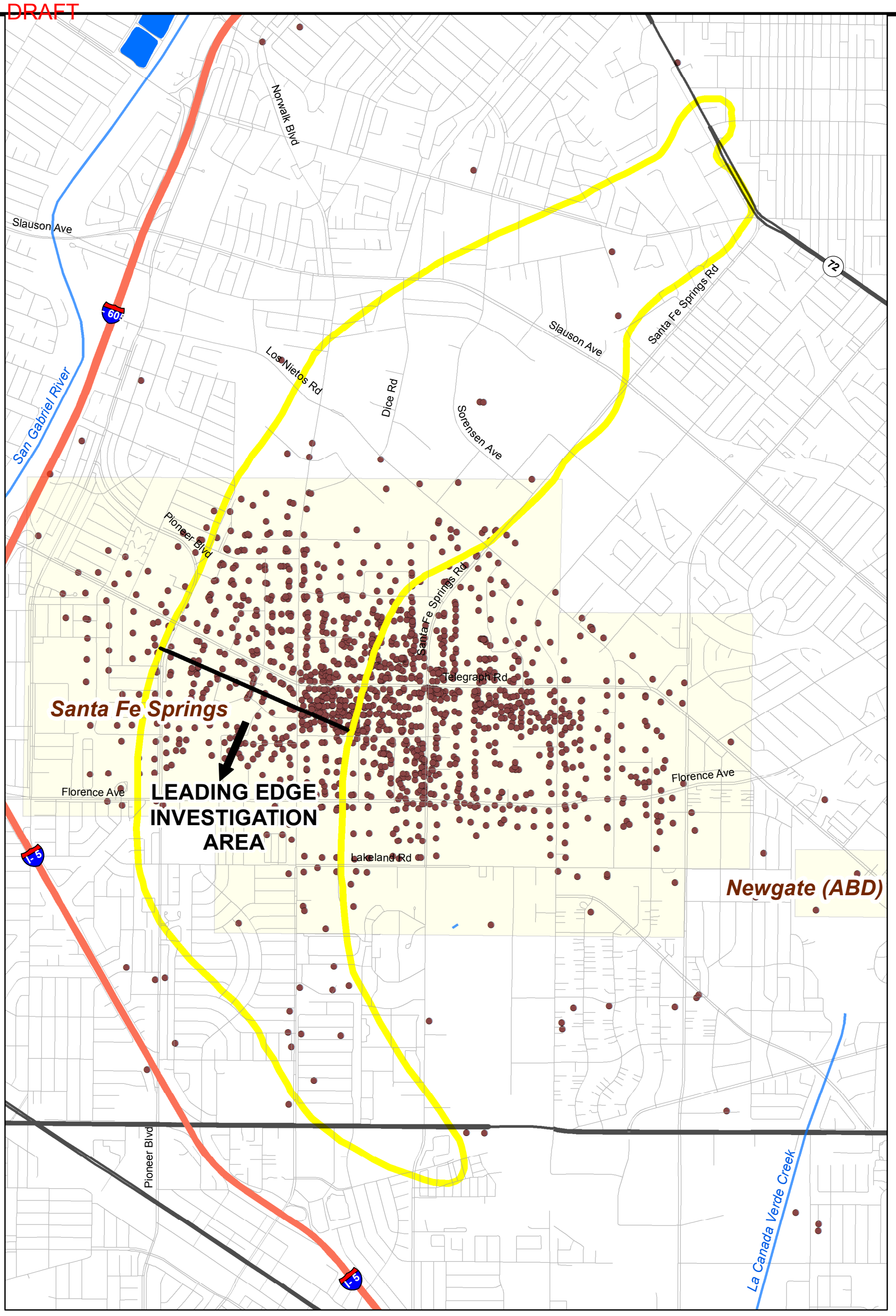
DRAFT

Document Name: 1217_LEI_Fig06_LandUse_D00 Date Exported: 9/16/2016

HARGIS + ASSOCIATES, INC.
Hydrogeology/Engineering

FIGURE 6. LAND USE IN AND AROUND OU2

DRAFT

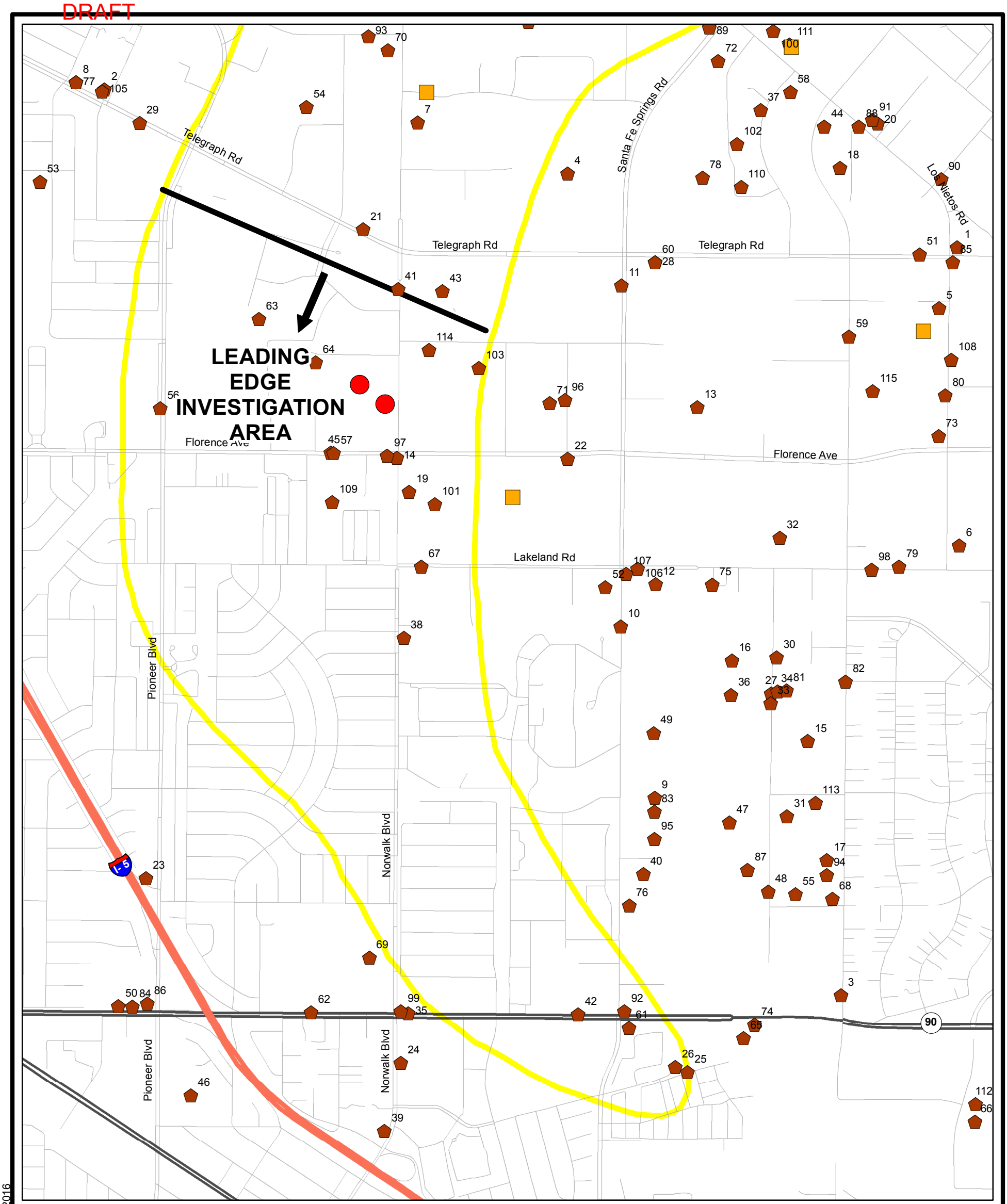


Document Name: 1217_LEI_Fig07_Oil_D00 Date Exported: 9/16/2016

HARGIS + ASSOCIATES, INC
Hydrogeology/Engineering

FIGURE 7. SANTA FE SPRINGS OIL FIELD

DRAFT



OU2 Boundary (2011 ROD)
Potenital Source Sites
OU2 Special or General Notice Sites
Known or Potential Source Site (RI Report)

NOTES:

OU2 Special or General Notice Sites have been identified by EPA as known source properties.

Known or Potential Source Sites have been indentified in the Remedial Investigation (RI) Report and does not include OU2 Special or General Notice Sites.

Supplemental identifications are based on Geotracker, Envirostor and other sources of information (refer to table for additional information).

ROD - Record of Decision
OU2 = Operable Unit 2

N

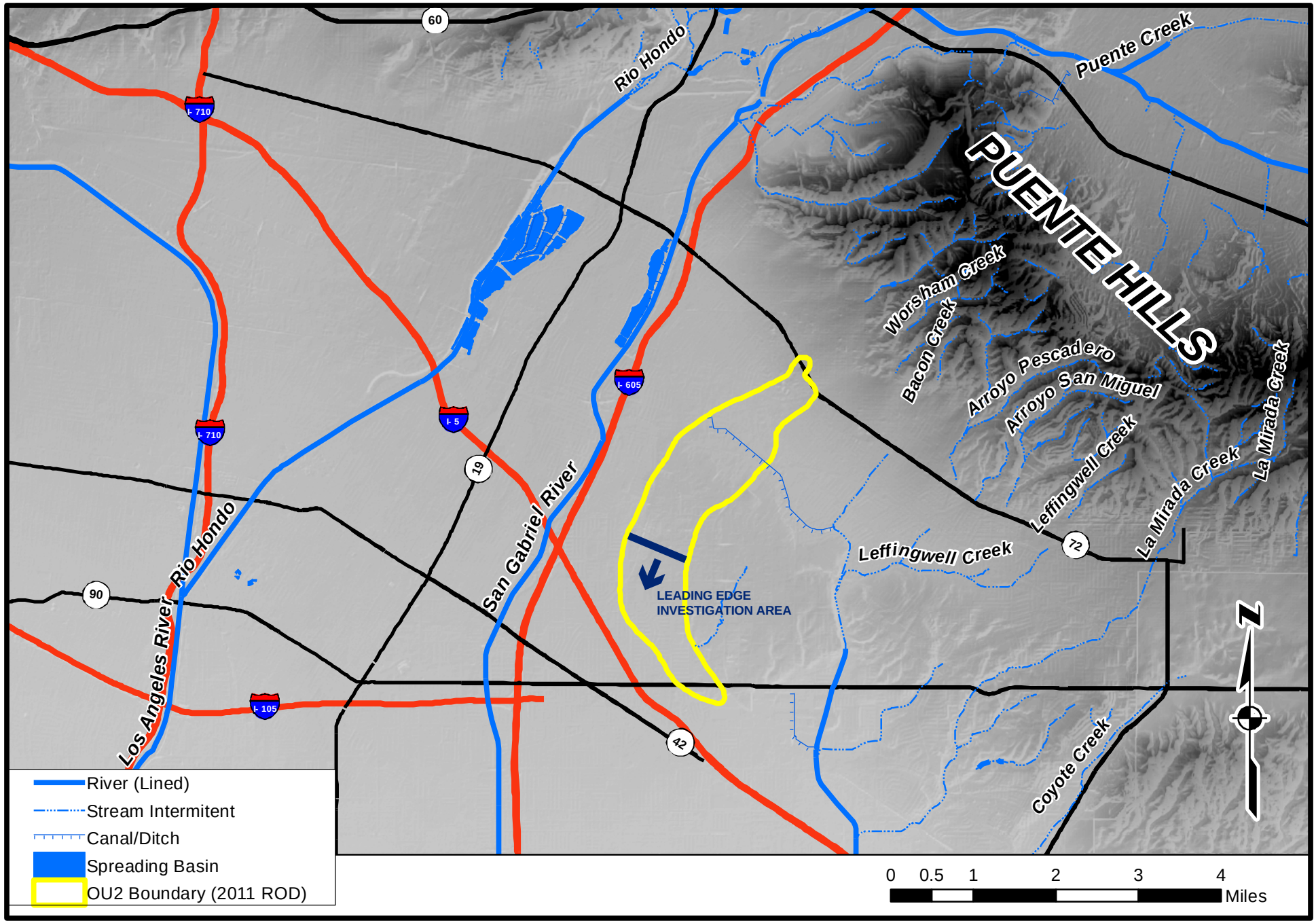
0 500 1,000 2,000 3,000 4,000
Feet

Document Name: 1217_LEI_Fig0X_Source_D01 Date Exported: 9/16/2016

HARGIS + ASSOCIATES, INC.
Hydrogeology/Engineering

FIGURE 8. SUPPLEMENTAL OU2 SOURCE IDENTIFICATION, LEADING EDGE INVESTIGATION AREA VICINITY

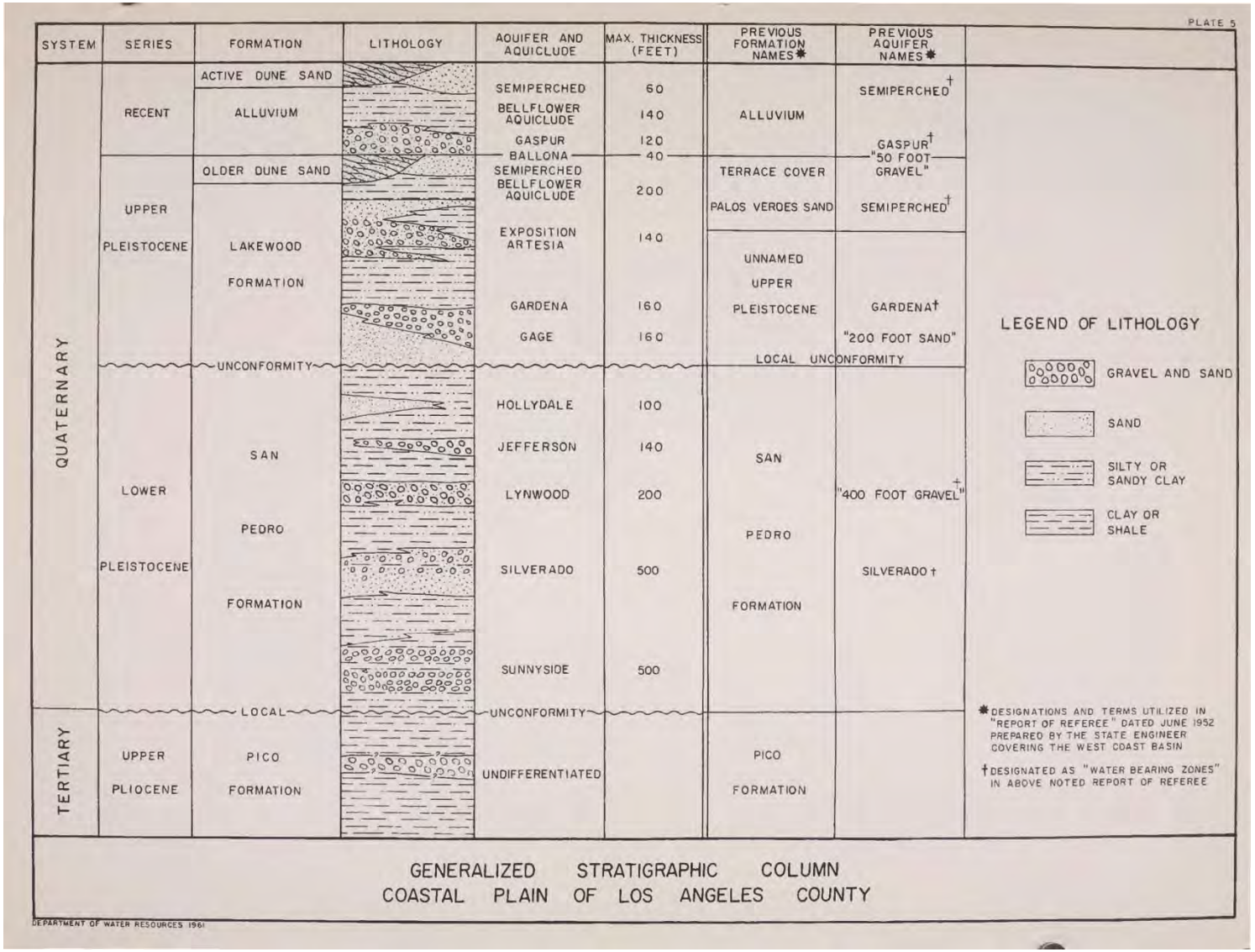
DRAFT



"\\oakland-01\data\GIS\Omega\Project\2016\LEIworkplan\Fig-09_MainPhysiographicFeaturesInOU2.ai"

HARGIS + ASSOCIATES, INC.
Hydrogeology/Engineering

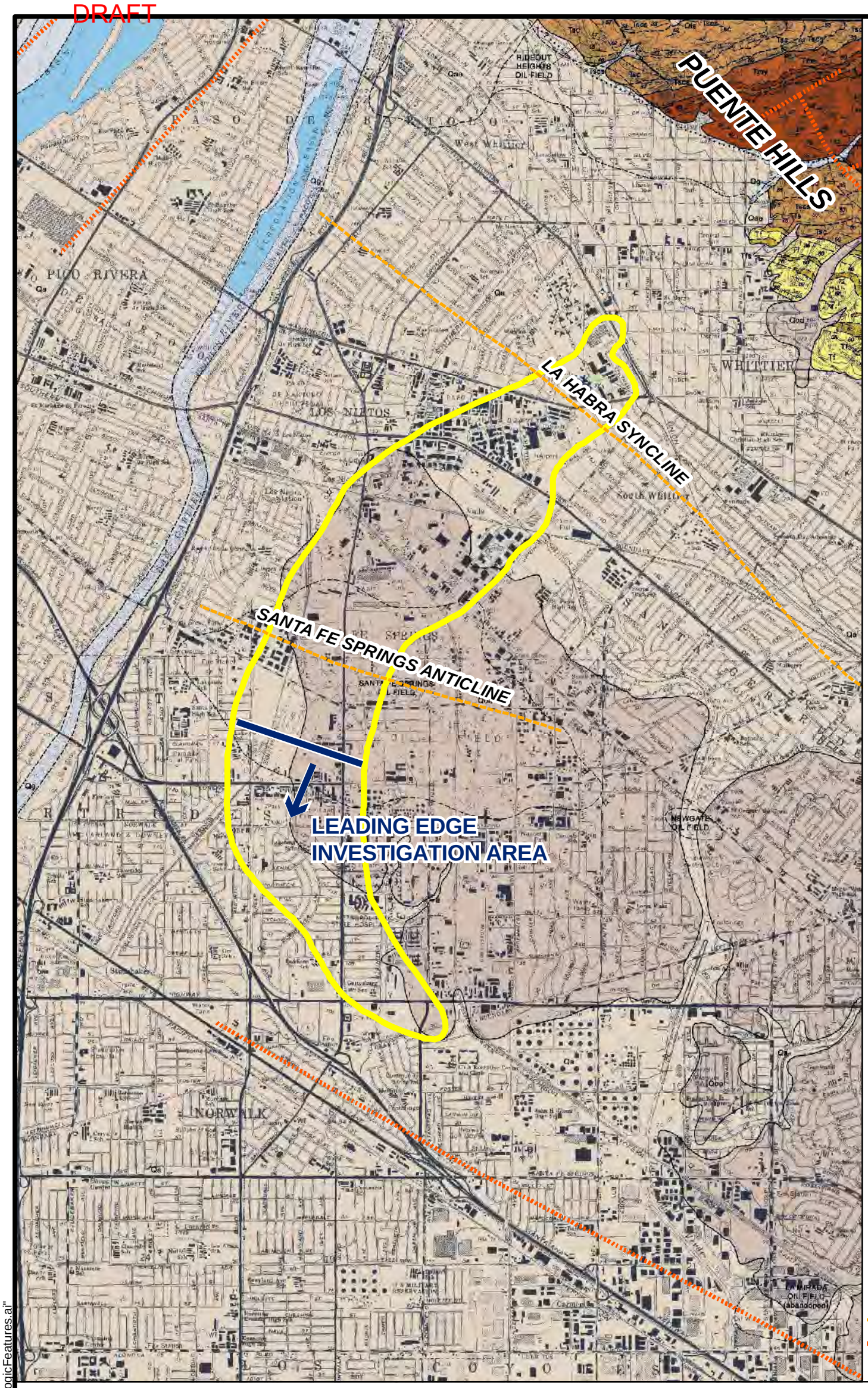
FIGURE 9. MAIN PHYSIOGRAPHIC FEATURES IN OU2



Reprinted from California Department of Water Resources Bulletin 104, 1961, Plate 5.

FIGURE 10. GENERALIZED STRATIGRAPHIC COLUMN, COASTAL PLAIN OF LOS ANGELES COUNTY

DRAFT



LEGEND

af / Qg / Qa
SURFICAL SEDIMENTS
Unidissected Alluvial Deposits

Qls
LANDSLIDE DEBRIS

Qae / Qoa
OLDER SURFICAL SEDIMENTS
Elevated and dissected alluvial deposits

UNCONFORMITY

Qlhc / Qlh
LA HABRA FORMATION

LOCAL UNCONFORMITY

Qsp
SAN PEDRO FORMATION

Tfs / Tf / Tfr
FERNANDO FORMATION

Tsc / Tscs / Tscg
SYACAMORE CANYON FORMATION

Tmy / Tm / Tmss / Tms / Tmlv
MONTEREY FORMATION

SOURCES OF INFORMATION:

Geologic Map:

Geologic Map of The Whittier & La Habra Quadrangles (Western Puente Hills) Los Angeles and Orange Counties, California

By Thomas W. Dibblee, Jr., 2001

Dibblee Geology Center Map # DF-74, Second Printing 2010

Other:

Folds (CH2MHill, 2010 RI Report)

Faults (from USGS)

GEOLOGIC SYMBOLS

not all symbols shown on each map

FORMATION CONTACT
dashed where inferred or indefinite
dotted where concealed

MEMBER CONTACT
between units of a formation
Prominent bed

CONTACT BETWEEN SURFICIAL SEDIMENTS
located only approximately in places

FAULT: *Dashed where indefinite or inferred, dotted where concealed, queried where existence is doubtful. Parrallel arrows indicated inferred relative lateral movement. Relative vertical movement is shown by U/D (U=Upthrown site, D=downthrown site). Short arrow indicates dip of fault plane. Sawteeth are on upper plate of low angle thrust fault.*

U / D, 25, ?

Strike and dip of sedimentary rocks

18 *inclined* | 20 *inclined (approximate)* | 80 *overturned* | *horizontal* | *vertical*

OTHER SYMBOLS:

Direction of landslide movement | *outline of water bodies shown on map* | *water well* | *oil well* | *springs*

OU2 Boundary (2011 ROD)

N

0 0.25 0.5 1 1.5 2 Miles

"\\oakland-01\data\GIS\Omega\Project\2016\LE\workplan\Fig-11_MainGeologicFeatures.ai"

HARGIS + ASSOCIATES, INC
Hydrogeology / Engineering

FIGURE 11. MAIN GEOLOGIC FEATURES

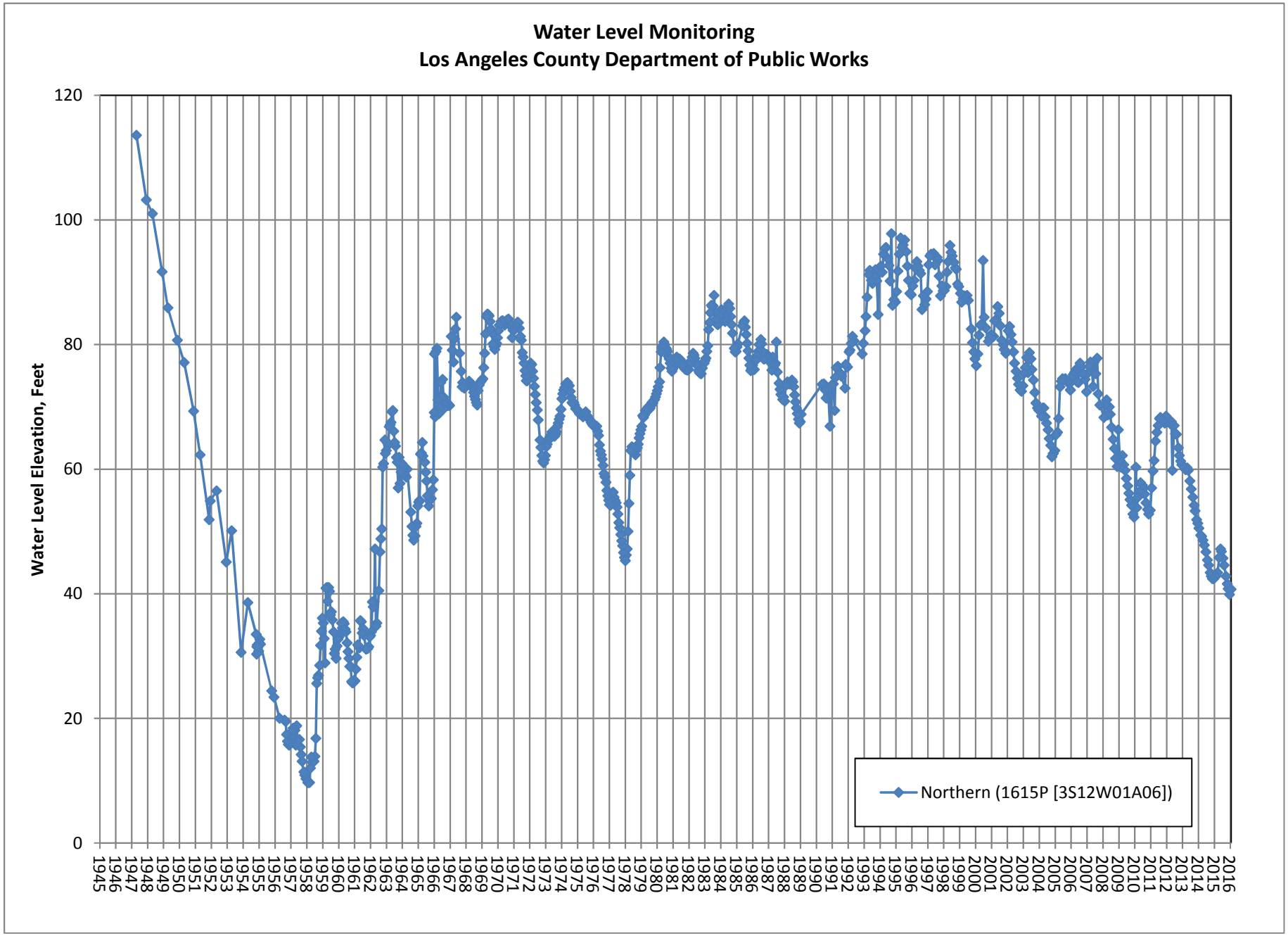
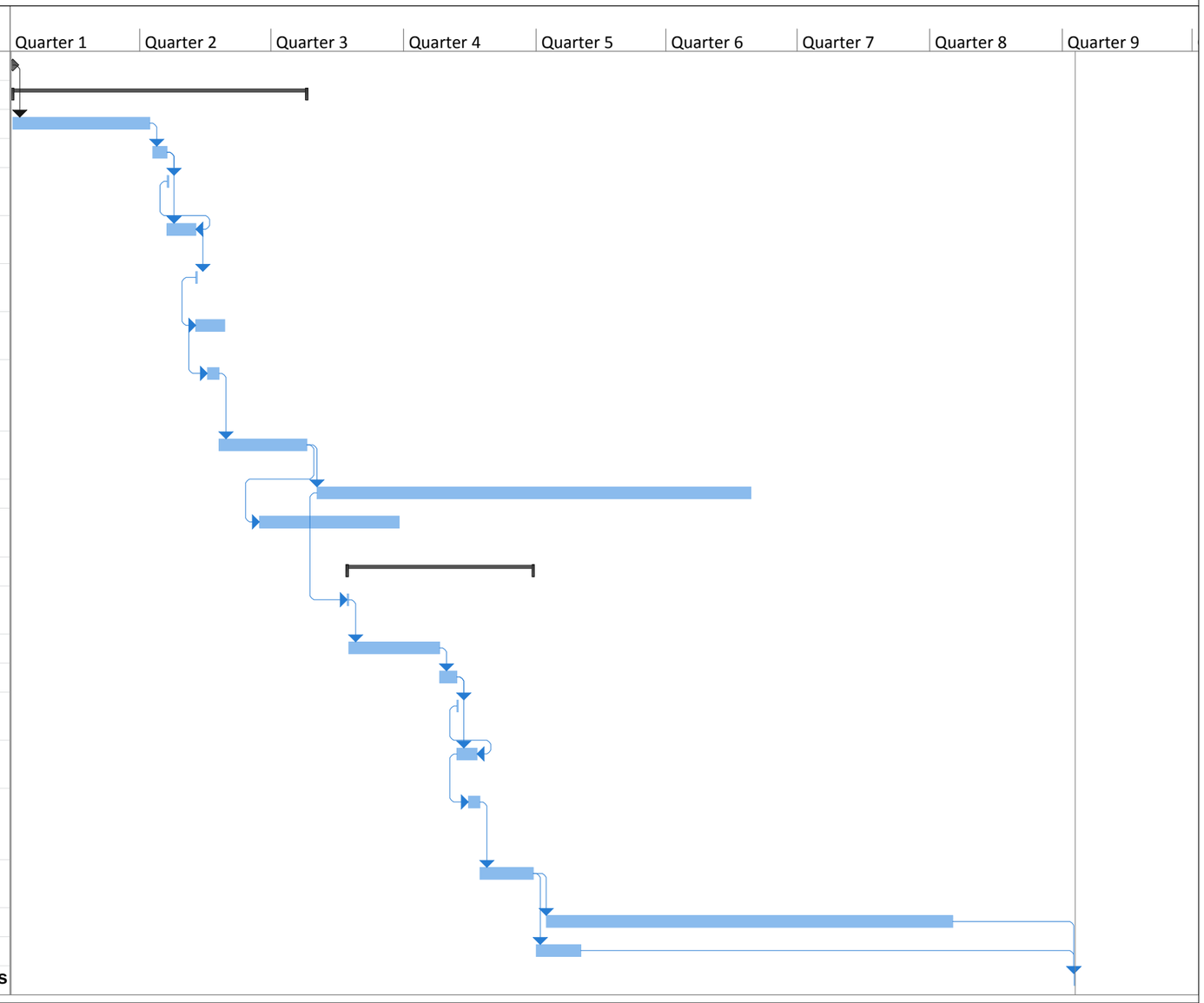


FIGURE 12. HISTORICAL GROUNDWATER HYDROGRAPH

Figure 13
LEI Work Plan Project Schedule
Omega Superfund Site
Operable Unit 2

ID	Task Name	Estimated Duration	Predecessors
1	**Consent Decree Entry and EPA Approval of LEI Work Plan**	**1 day**	
2	**Installation of LE Well Clusters 1 and 2**	**146 days**	
3	Access and permitting for LE well clusters 1 and 2	69 days	1
4	Exploratory boring and geophysical logging at LE well cluster 1	8 days	3
5	Provide EPA with geologic and geophysical log and proposed screen interval for deepest monitoring well at LE well cluster 1	1 day	4
6	Installation of deepest monitoring well at LE well cluster 1 and exploratory boring and geophysical logging at LE well cluster 2	14 days	4,5SF+1 day
7	Provide EPA with geologic and geophysical log and proposed screen interval for deepest monitoring well at LE well cluster 2	1 day	6
8	Installation of deepest monitoring well at LE well cluster 2 and well development of deepest wells at LE well clusters 1 and 2	14 days	7SS
9	Technical memorandum, meeting with EPA, and EPA approval of screen intervals for up to four additional monitoring wells at each of the LE well clusters 1 and 2	6 days	8SS+6 days
10	Installation and development of up to four additional monitoring wells at LE well clusters 1 and 2	43 days	9
11	**Quarterly Sampling of LE Well Clusters 1 and 2**	**215 days**	**10FS+5 days**
12	**Transducer Installation in Koontz Well Cluster and LE Well Clusters 1 and 2**	**69 days**	**10FS-23 days**
13	**Installation of LE Well Cluster 3**	**93 days**	
14	Meeting with EPA to discuss location of LE well cluster 3 and EPA approval	1 day	11SS+15 days
15	Access and permitting for LE well cluster 3	45 days	14
16	Exploratory boring and geophysical logging at LE well cluster 3	8 days	15
17	Provide EPA with geologic and geophysical log and proposed screen interval for deepest monitoring well at LE well cluster 3	1 day	16
18	Installation and development of deepest monitoring well at LE well cluster 3	10 days	16,17SF+1 day
19	Technical memorandum, meeting with EPA, and EPA approval of screen intervals for up to four additional monitoring wells at LE well cluster 3	6 days	18SS+6 days
20	Installation and development of up to four additional monitoring wells at LE well cluster 3	27 days	19
21	**Quarterly Sampling of LE Well Cluster 3**	**202 days**	**20FS+5 days**
22	**Transducer Installation in LE Well Cluster 3**	**23 days**	**20**
23	**Submit LEI Report to EPA**	**1 day**	**22,21FS+60 days**



Project: LEI Work Plan Project Schedule
Date: Tue 9/27/16
Notes:
EPA – United States Environmental Protection Agency
LE – Leading Edge
LEI – Leading Edge Investigation

Task	External Tasks	Manual Task	Finish-only		
Split	External Milestone	Duration-only	Deadline		
Milestone	Inactive Task	Manual Summary Rollup	Progress		
Summary	Inactive Milestone	Manual Summary	Manual Progress		
Project Summary	Inactive Summary	Start-only			